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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/711,685	09/30/2004	Greg A. Hanlon	PES-0220	5684

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EXAMINER	
LEE, CYNTHIA K	

ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/711,685	HANLON ET AL.	
	Examiner	Art Unit	
	Cynthia Lee	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 September 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/30/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

OFFICE ACTION

Drawings

The drawings received 9/30/2004 are acceptable for examination purposes.

Information Disclosure Statement

The Information Disclosure Statement (IDS) filed 9/30/2004 has been placed in the application file and the information referred to therein has been considered.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claim 1 is provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1,6,7 of copending Application No. 10985633. Although the conflicting claims are not identical, they are not patentably distinct from each other. Claim 1 of the instant application and claims 1,6, 7 of the copending application claim a bipolar plate wherein the first side comprises a fluid flow region in communication with a first set of ports; the second side comprises a fluid flow region in communication with a second set of ports, and another

layer in between the first and second side comprising first set of fluid flow channels in communication with the first fluid flow region and second set of fluid flow channels in communication with the second fluid flow region. The copending application does not disclose the orientation of the fluid flow region to be in different directions. However, it is obvious because is well known in the art to orient the two flow regions in different directions (see Faita et. al. col. 2, lines 20-25). Therefore, claim 1 of the instant application fully encompasses claims 1,6,7 in the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims Analysis

Regarding claims 17 and 21, the method of forming the device is not germane to the issue of patentability of the device itself. Therefore, the diffusion bonding and lamination of the bipolar plates has been considered but was not given patentable weight. *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP 2113.

Further, the examiner notes that the claimed layers in the bipolar plate are present as one layer in the final product, since the applicants do not specify that each layer comprises a different material. Therefore, the limitation of the layers was considered, but was not seen as a distinction over prior art comprising one layer.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 13-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 13 and 20 are set forth as "an electrochemical cell, comprising a plurality of membrane-electrode-assemblies (MEAs) alternatively arranged with a plurality of flow field members between a first cell separator plate and a second separator plate." It is unclear what is between first and second separator plates, the flow field members or the alternative arrangement of the MEAs and the flow field members. Also, it is unclear whether the separator plates correspond to a first cell and a second cell or first and second separator plates of a single cell within a stack, since the applicant is using the word cell (line 1 of claims 13 and 20) to mean a conventional stack. The best possible interpretation was used to examine claims 13 and 20.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 8-13,16-22 are rejected under 35 U.S.C. 102(b) as being fully anticipated by Faita et. al. (US 5565072).

With respect to claim 1, Faita discloses a bipolar plate with a first and second side comprising grooves (through channels) (15:66-67) and holes (ports) (3 in fig. 2) connected by distribution channels (header channels) (3 in fig 2). Further, Faita's grooves on each side of the plate by design are not in communication because one side is for the anode gas and another side is for the cathode gas (12:54-63). Although Faita does not expressly disclose the second side fluid flow configuration (fig. 2), the fact that the grooves are present on the second side (15:66-67) indicates that the fluid flow configuration on the second side is the same as the first side, incorporated in the entire Office Action herein.

The examiner has considered the limitations of the bonded layers of the bipolar plate. However, the applicants' bipolar plate was not distinct from Faita's invention for the reason stated above.

With respect to claim 2, the grooves are at 90° from each other (15:66-67).

With respect to claim 3, the inlet and outlet holes on each side (ports) are diagonally placed from each other (fig. 2).

With respect to claim 8, Faita's distribution (header) channels (3 in fig. 2) extend from the grooves (through channels) (15:66-67) in the active area of the bipolar plate to the holes (ports) on each side (2 in fig.2).

With respect to claim 9, the four distribution channels (two on each side of the plate) in Faita's bipolar plate are isolated from each other (fig. 2).

With respect to claim 10, the limitation of the diffusion bonding of layers was considered, but was not seen as distinct from Faita for the reason stated above.

With respect to claim 11, Faita's distribution (header) channels comprise a plurality of header channels (fig. 2).

With respect to claim 12, Faita discloses that his plates are made of titanium (6:8).

With respect to claim 13, Faita discloses an electrochemical cell comprising an alternating arrangement of membrane electrode assemblies (MEAs) (6 and 7 in fig. 6) and bipolar plates (16 in fig. 6) between separator plates (17 in fig. 6), said bipolar plate with a first and second side comprising grooves (through channels) (15:66-67) and holes (ports) (3 in fig. 2) connected by distribution channels (header channels) (3 in fig 2), wherein the grooves are at 90° from each other (15:66-67). Faita's bipolar plates comprise inlet and outlet holes (ports) that connect the grooves (15:66-67) by the distribution channels (3 in fig. 2). Further, Faita's grooves on each side of the plate by design are not in communication because one side is for the anode gas and another side is for the cathode gas (12:54-63). Although Faita does not expressly disclose the second side fluid flow configuration (fig. 2), the fact that the grooves are present on the second side indicates that the fluid flow configuration on the second side is the same as the first side.

The examiner has considered the limitations of the bonded layers of the bipolar plate. However, the applicants' bipolar plate is not seen to be distinct from Faita's invention for the reason stated above.

With respect to claim 16, Faita's MEA comprises an oxygen electrode and a hydrogen electrode (7 in fig 6); and the first layer of the bipolar plate is proximate the oxygen electrode (18 in fig. 6). Although Faita does not expressly disclose that his electrodes comprise an oxygen and a hydrogen electrode, Faita teaches that the gases fed to the bipolar plates are fed to the anode and cathode compartments (12:54-63). Thus, Faita's electrodes must teach an anode and a cathode.

With respect to claim 17, the limitation of the diffusion bonding of layers was considered, but was not given patentable weight for the reason stated above.

With respect to claims 18 and 19, Faita discloses bipolar plates with grooves (through channels) (15:66-67). Since the bipolar plates in Faita's Example 5 referred to the same bipolar plates as in Example 1, which refers back to the figures, Faita's grooves must be located in the flat region located in the center of the bipolar plate in which a gasket seals around the border, the grooves, and the inlet and outlet holes (ports) (figs. 2 and 3; 6:27-35). Although Faita does not expressly disclose the second side fluid flow configuration (fig. 2), the fact that the grooves are present on the second side (12:54-63) indicates that the second side must have the same configuration of the first side.

With respect to claim 20, Faita discloses an electrochemical cell comprising a an alternating arrangement of membrane electrode assemblies (MEAs) and bipolar plates between separator plates (17 in fig. 6), said bipolar plate with a first and second side comprising grooves (through channels) (15:66-67) and holes (ports) (3 in fig. 2) connected by distribution channels (header channels) (3 in fig 2), wherein the grooves

are at 90° from each other. Faita's bipolar plates comprise inlet and outlet holes (ports) that connect the grooves (15:66-67) by the distribution channels (3 in fig. 2). Further, Faita's grooves on each side of the plate by design are not in communication because one side is for the anode gas and another side is for the cathode gas (12:54-63). Although Faita does not expressly disclose the second side fluid flow configuration (fig. 2), the fact that the grooves are present on the second side (15:66-67) indicates that the fluid flow configuration on the second side is the same as the first side

The examiner has considered the limitations of the bonded and laminated layers of the bipolar plate. However, the applicants' bipolar plate is not distinct from Faita's invention for the reason stated above.

With respect to claim 21, the limitation of the diffusion bonding of layers was considered, but was not given patentable weight for the reason stated above.

With respect to claim 22, Faita discloses that the bipolar plates made of titanium or stainless steel (6:7-15).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4,5, 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faita et. al. as applied to appropriate claims above, and further in view of Wilson (US 2004/0197630).

The applicant is claiming a thickness of layers. Since the layers do not exist in the final product, the examiner has interpreted the thickness to be the thickness between the valley of the grooves on each side of the plate.

Wilson discloses a bipolar plate with a channel width of 0.8 mm and depth of 0.25 mm (0031; 0033, lines 5-6), thus clearly teaching that the groove dimensions are result effective variables. It has been held by the courts that discovering an optimum value or workable ranges of a result-effective variable involves only routine skill in the art, and thus not novel. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). See MPEP 2144.05. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to make the grooves on Faita's bipolar plates with the groove dimensions for the purposes of fine tuning the pressure drop of the reactant gases and improving the overall performance of the plate, as taught by Wilson (0031 lines 4-6; 0032 lines 5-8).

Claims 6,7,15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Faita et. al. as applied to appropriate claims above, and further in view of Toshihiro (JP 05-251097).

Toshihiro discloses a bipolar plate wherein the plate comprises grooves of different lengths, in which an upstream portion of a first side of the plate has one width and a downstream portion of the first side has a second width (fig. 1). This configuration was designed by Toshihiro so that the stay of condensed water in the gas channel grooves in the bipolar plate can be eliminated to eject the water quickly

(abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Faita's grooves with two of Toshihiro's bipolar plate facing back to back of each other wherein the larger width of the two widths on the first side is greater than the smaller width on the second side. The motivation would be for the purpose of improving condensed water elimination, as taught by Toshihiro.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ckl

Cynthia Lee

Patent Examiner

PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER